

Implementing Excellence at Salina's Municipal Solid Waste Landfill

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Defining the Scope

To some degree, nearly everyone has been affected by the Great Recession that has gripped our nation for the last eight years. The only landfill facility within Saline County, overseen by City of Salina Public Works Department, is no exception.

Landfill staff members have always sought to position its solid waste disposal operations as a model for other cities in Kansas to emulate. However, to do so during a major economic downturn would have required significant effort. Changing past practices and implementing a sound, more aggressive long-term plan would be necessary.

In addition to declining tax revenues, the landfill (one of eighteen Subtitle D municipal solid waste landfills operating in the state) faced the loss of one of its largest customers, who generated one-fifth of the facility's revenue.

Measuring the Work

Since landfill staff members had already implemented Continuous Process Improvement (CPI) (a basic CPI framework combined with the use of Lean and Six Sigma) throughout the City of Salina in 2012, landfill staff members conducted a process review that included an evaluation of every step within every process of the landfill's entire operation. The review provided a detailed list of all functions performed at the landfill and the time they took, and it suggested ways to improve. Armed with this information and a landfill master plan that was adopted by the City Commission in 2012, landfill staff members were now positioned to implement strategic decisions that would not only save additional time and money, but help ensure a path to excellence.

Analyzing the Data

Next, landfill staff members thoroughly analyzed every aspect of its landfill operations: emissions issues and restrictions (to include, but not limited to air quality compliance); best practices for waste disposal operations; construction quality assurance planning; closure and post-closure care; disposal cell capacity, composition, life cycle, and size; electrical systems; geological, airspace or other applicable restrictions; greenhouse gas emissions; groundwater characteristics and trends; holiday and work schedules;

horizontal and vertical construction requirements; landfill gas (LFG) collection and utilization; leachate collection, conveyance, storage and disposal systems; liner systems; litter collection operations; pumps; stormwater management; vehicles and equipment; and waste acceptance rates.

Improving our Operations

The following recommendations were identified after considering the optimal landfill design for a facility of this size, the number of customers serviced, the composition of waste, the site's hydrogeology, current waste-in-place, and other existing site features and restrictions.

1. Standardize instructions used by scale house attendants to improve directions given to customers.
2. Perform 6S (sort, set in order, shine, safety, standardize, sustain) projects on the landfill's equipment and supply storage areas to better organize the facilities and improve employee productivity.
3. Assign the landfill's Saturday crew the task of preparing the work area for the following week to facilitate a timelier opening on Monday.
4. Adopt standardized hand signals to improve communications between equipment operators and other landfill staff.
5. Whenever possible, use the city surveyor for landfill surveying instead of hiring contractors.
6. Excavate soil from future cell sites and use it as cover material for existing sites.
7. Construct a large leachate pond to reduce reliance on pumping operations for leachate disposal.
8. Use gravity-fed drainage systems, to reduce pump installation, maintenance and repair costs.
9. Use electrical versus pneumatic pumps to reduce ongoing operation and maintenance costs.
10. Improve litter catchment by installing additional portable fencing around the active disposal cell.
11. Collect windblown litter more efficiently by obtaining a large litter picker that can be pulled behind a tractor to cover large

"For many years the City of Salina has done a fine job of operating its Subtitle D municipal solid waste landfill. Recent efforts to update the facility boundary controls, to prepare a master plan that addresses full site development, and to improve leachate management using gravity flow are noteworthy achievements."

-Bill Bider, Bureau of Waste Management Director, Kansas Department of Health & Environment

areas, and collect litter at a reduced cost by hiring jail trustees to pick litter along the edges and in areas not accessible by motorized equipment.

12. Reduce flat tires by using a vehicle-mounted road broom to collect nails and other sharp objects.
13. Use CAT-certified rebuild/warranty programs for existing heavy equipment whenever possible.
14. Adjust hours of operation on Saturdays to meet customer needs while maximizing efficiency.
15. Adjust the tipping fee so that it is competitive with others across Kansas to maximize potential revenues.
16. Design cells to meet industry best practices while providing 4-5 years of life at projected rates.
17. As new CPI projects are approved, re-evaluate tasks and task completion times to capture additional savings.
18. Consider adding on-board GPS systems to heavy equipment to help verify compaction rates.
19. Continue exploring future options for LFG-to-energy projects, such as gas conversion for natural gas vehicles.
20. Continue exploring alternative final covers, liquids additions, and other potential opportunities.


Controlling the Results

As a result of implementing fifteen of the twenty recommendations thus far, time availability has increased by 223 hours, 2014-2015 expenses have been reduced by \$666,263, and 2016-2018 expenses are expected to be further reduced by another \$610,000.

Landfill staff members are in the process of analyzing and implementing recommendation 11. Upon completion, time availability will increase by an additional 750-875 hours, and annual costs will be further reduced by \$36,000.

Means to Achieving Goals

If managing resources within a restrictive economic environment and operating your organization as efficiently as possible interests you, then applying the principles of Continuous Process Improvement (Lean and Six Sigma principles) will provide you with a means to achieve your goals.

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